THE OCCURRENCE OF CRYPTONEMIA HIBERNICA GUIRY ET IRVINE ON THE SOUTH COAST OF IRELAND

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ABSTRACT. — Cryptonemia hibernica was first described as a new species in 1974 by COIRNY and INVIRE based on deiffer material from Cork Hadoux. The in situ occurrence of this species is described from three locations on the south coast of Ireland, where it is from it in the subtract. It as billity to grow in a wide variety of habitats apparently accounts for its successful colonisation at these locations. It displays a great tolerance to sand abra ion, allt, reduced light and variants degrees of currents.

RÉSUMÉ. Cryptonemia hibernica a ĉié décrit pour la première fois en 1974 par GURY et IRVINE à partir de matériel flottant dans le port de Cork. La présence in situ de cette répéce est décrite i à partir de récoltes réalisées dans trois stations de la côte sud de l'Irlande où elle se trouve dans l'étage sublittoral. Son aptitude à pousser dans une grande variéé d'habitate explique sans docute les raisons qui lui out permis de colonsier ces stations. Lile supporte bien l'abration par le sable, les caux turbides, un éclairement réduit et diverses annes de courant.

Cryptonemia seminervis (C. Ag. J. Ag. was recorded by CROUAN and CROU-AN (1867) from Brest and by FELDMANN and MAGNE (1964) from the French Channel Coast. In 1966 den HARTOG found a single tetraspoir diff specimen of Cryptonemia in the Channel Islands and the genus was therefore included in the checklist of British Marine Alage (PARKE and DIXON, 1968) as Cryptonemia lactuca (C. Ag.) J. Ag. It is now believed that this specimen is C. seminervis.

In 1971 drift material of the genus *Cryptonemia* was first collected by GUIRY (GUIRY & IRVINE, 1974) at Camdem at the mouth of Cork Harbour on the south coast of Ireland. The material was not recognisable as belonging to any of the existing taxa.

* Botany Department, University College, Cork, Ireland. Cryptogamie : Algologie, 1981, II, 3 : 179-184. There are some twenty-four species in the genus *Cryptonemia*, these of which occur in the Mediterranean and five in the Atlantic and Caribbean, GUI. RY and IRVINE having examined the various species of the genus concluded that the Cork Harbour material was most closely related to a group of three follose species from the Eastern Pacific and, in particular, or *C. borealis* (GVI. The main differences between the Cork Harbour material and *C. borealis* (GVI. RY and IRVINE 1974) apart from the size, appears to be that the blades of *C. borealis* are obovate but never lanceolate, whereas, the Cork Harbour material has ovate, obovate and broad/ly lanceolate blades.

The Cork Harbour material is larger and thicker than C. borealis. The former species ranges from 80-350µm in thickness and up to 600µm in length, whereas the latter varies from 60-100µm in thickness and 80-160µm in length. The dimensions of the Irish material more closely resemble C. obousta J. Ag, and C. argustatus (letten et Garcha) Dawson than C. borealis.

GUIRY and IRVINE concluded that the Irish material was not completely identifiable with any of the Eastern Pacific species and therefore raised it to the status of a new species, *Cryptonemia hibernica*, spending a revision of the genuss.

In 1976 attached living material of C. *hibernica* was found for the first time at Ringabella at the south western extremity of Cork Harbour (CULLINANE and WHELAN). In 1979 the species was found in Oysterhaven and Kinsale some ten to filteen miles West of Cork Harbour (fig. 1).



Fig. 1 — Shows the position of the areas (Kinsale Harbour, Oyster Haven and Cork Harbour) on the south coast of Ireland where attached living material of *Cryptonemia hibernica* has been found.

180



Fig. 2 — Map of Cork Harbour showing where strached muterial of Cryptonemia hiberatics has been found and the locations of the major currents within the harbour. 1 Ringabells 2: Poulnealler Bay (Churchbay). 3: Weaver Point, 4: Ram's Head (Candeal). 5: Curtane Bank. 6: Nexr Spile Liand. 7: Spibunk. 8: Fast Ferry 9: Aghida Pire. 10: Lower Aghida. 11: Long Point. 12: Corkbeg. 13: Fort Davis (Carlisle). 14: White Bay, 15: Rochet's Point.

The species is widely distributed in the lower (seaward) parts of Cork Har bour (fig. 2) where it is the dominant or co-dominant species at many of the locations. It is most abundant in the harbour at the south western tip of Carlisle headland (= Fort David) e. g. some thirty plants per sq. m. at a depth of 3 m below Chart Datum. It is abundant and widely distributed in Kinasle Harbour from about a half a mile suprivers above Kinasle town, and «downrivers to south of the Charles's Fort (fig. 3). At Oysterbaven, however, the species is restricted to one headland in the centre of this small bay.

A general seaweed survey of Cork harbour was carried out at one mile intervals during the period 1969-1970 (CULLINANE, 1971), *Crystonemia* was not observed during that survey. It appears that it established itself on the south coast of Ireland between 1969 and 1971. It is not known at which one of the three areas (Cork Harbour, Kinaale or Oystenhaven) it first became established, or whether it was introduced into more than one of these areas independently, or whether it spread from one of these areas to the others. The fact that it was not recorded at Kinale until 1979, three years after it had been found growing in Cork Harbour and eight years after dift specimens had been recorded from Cork Harbour, could be attributed to the lack of phycological work, especially subtidal work in Kinasle prior to 1979, it cannot be assumed that it was growing in Cork Harbour before the other two area.

181



Fig. 3 — Map of Kinsale Harbour showing the distribution of Cryptonemia hibernica (stippled).

It is possible that C. hibernica was introduced by shipping or with oysters. Cork has one of the best harbours in the world with a varied and international shipping trade, while both Cork Harbour and Kinsale are well known yachting centres. The possibility of the introduction of C. hibernica into Cork harbour by natural gas and petroleum exploration ships, including rigs, cannot be excluded since such vessels were known to have been at anchor within the harbour on various occasions since 1970. The introduction of exotic species with oysters has been suggested for Sargassum muticum (Yendo) Fensholt on the south coast of England (FARNHAM et al. 1973). RUSSELL (1980) showed that more than 27 species of marine algae have been cultured from the water that accompanied two shipments of juvenile clams and ovsters from California to Hawaii. Cork, Kinsale and Oysterhaven are all estuaries, the former two are the locations of oyster culture industries. In both Cork Harbour and Kinsale Crassostrea gigas and Ostrea edulis are cultured, seed ovsters being imported from nurseries in the United Kingdom only, Ovsterhaven, though not a site of oyster culture industry, is regularly frequented by yachts from Kinsale and Cork Harbour.

Cryptonemia hibernica can have a bullate or blittered effect on the hallus, as described by GUIRY and IRVINE (1974) and also described for Platoma (IRVINE, IRVINE and GUIRY, 1978). In the case of C. hibernica while this feature is common in drift material it is relatively rate in living attached material. The Platoma material was entirely drift. A similar blitstring effect is said (L. IRVINE pers. com.) to occur on C. seminerois from the Channel Islands and this material was likewise found in drift. Plants of all sizes, from small leaflets to mature fronds, are found at all locations at all times of the year, indicating that plants are, undoubtedly, perennials. The longevity of the individual leaflets or entire plants is not known.

The species grows on a very wide variety of substrates, e.g. mohile stones and shells, bedrock, and occasionally on *Laminaria* holdfasts. Since it grows on migratory single and shells it is difficult at times to determine whether a specimen is actually growing at a location or merely drifting. e. g. specimeas found near Aphada, on the Eastern side of Cork Harbour, in a Zostera bed near the Spit Lighthouse, and near James's Fort in Kinsale. In Cork Harbour at Ram's Head (= Camden) specimens attached to shells and stones have firequently been observed being carried in the very strong current. Plants growing on mobile substrates in strong currents always tend to be linear-lanceolate and never obsvarte-ovate.

Gryptonemia hibernica shows a great tolerance of sand, sand abrasion (e.g. at Ringabella), silt, reduced light intensity (most locations in Cork Harbour and Kinsale) and varying degrees of currents. In Cork Harbour the locations of the more extensive populations of *Cryptonemia* generally occur in areas of current (figure 2).

BØRGESEN (1938) has recorded the genus at depths of up to 100m. Irish material is only found between1/2 m to 11 m below Chart Datum. This latter depth appears to represent the lowest limit of all macro-algal vegetation in both Cork Harbour and Kinsale, so that C. hiberuica is the deepest growing macro-alga at many locations.

The following are the seaweeds most often occuring with Cryptonemia : Dilsea carnoza (Schmidle) O. Küntre: Delessiria surguinea (Huds.) Lamour; Dolyajhonia migresens (Huds.) Grev; Cracilaria verrucosa (Huds.) Papent; Brognintella byssoides (Good et Woodw.) Schmitz; Laminaria sascharina (L.) Lamour; Cryptopleura ramosa (Huds.) Kylin ex Newton; Calophyllis lachinata (Huds.) Kütz; Rhodomela corferoides (Huds.) Silva; Plocamium cartilagineum (L.) Dixon and Phyllophora pseudoceranoides (S. G. Gmel.) Newr. et A.R.A. Taylor.

The following are some of the more common species of fauma associated with Cryptonemia : Artedon bifida (on the Curlane Bank); Tealia felina: Lanice conclulega, Bucchum undatum, and Mysicola incrustars, Antennularia antenina is very abundant at depths of 8-10 m near Carlisle. Echima esculentus has been observed using Cryptonemia sa a covering material.

The following is a list of the epifauna from attached Gyptomenia material : Grisia eburnea. Grisia aculeata: Electra pilosa, Hippothoa hyalina, Verruea stroomia, Celloporina hasalili, Grisidia cornuta, Tabulipora sp., Scraparia chelata, Botrylloides leachi, Scruparia chelata, Bioellariella ciliata, Modiolus barbatus and Balamos cenenato.

Cryptonemia hibernica appears to possess many of the features of a recently introduced species. It is extremely abundant in parts of Cork Harbour and Kinale where it is widely distributed growing on a wide variety of habitats showing a great tolerance for sand abrasion, silk, very reduced light and various degrees of currents. Its tolerance of such widespread conditions permits it to grow in areas where nearly all other seaweeds are, apparently, incapable of surviving (except possible micro and/or encrusting algae). From observations, it would appear that C. hibernica has exploited available habitats most of which are not utilised by other species, with no apparent depauperation of the local flora.

ACKNOWLEDGEMENTS

The work was carried out as part of an overall survey of Cork Harbour funded by the Irish National Board for Science and Technology. The authors wish to thank Professor RYLAND of University College of Swansea for identification of the epifanna.

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